

WHAT IS CLAIMED IS:

1. A paper product that includes at least one paper web, said paper web comprising:
 - 5 hardwood fibers treated with a first hydrolytic enzyme capable of hydrolyzing said hardwood fibers to form aldehyde groups predominantly on the surface of said hardwood fibers, wherein the dosage of said first hydrolytic enzyme is from about 0.1 to about 10 s.e.u. per gram of oven-dried pulp; and
 - 10 an additive applied to said paper web, said additive being selected from the group consisting of a cross-linking agent, a strength agent, a debonder, and combinations thereof.
2. A paper product as defined in claim 1, wherein the dosage of said first hydrolytic enzyme is from about 0.1 to about 5 s.e.u. per gram of oven-dried pulp.
- 15 3. A paper product as defined in claim 1, wherein the dosage of said first hydrolytic enzyme is from about 0.1 to about 2 s.e.u. per gram of oven-dried pulp.
- 20 4. A paper product as defined in claim 1, further comprising softwood fibers.
- 25 5. A paper product as defined in claim 4, wherein at least a portion of said softwood fibers are treated with a second hydrolytic enzyme capable of hydrolyzing said softwood fibers to form aldehyde groups predominantly on the surface of said softwood fibers.
6. A paper product as defined in claim 5, wherein the dosage of said second hydrolytic enzyme is from about 0.1 to about 10 s.e.u. per gram of oven-dried pulp.
- 25 7. A paper product as defined in claim 5, wherein the dosage of said second hydrolytic enzyme is from about 0.1 to about 5 s.e.u. per gram of oven-dried pulp.

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- 100-200-300-400-500-600-700-800-900
8. A paper product as defined in claim 5, wherein the dosage of said second hydrolytic enzyme is from about 0.1 to about 2 s.e.u. per gram of oven-dried pulp.
 9. A paper product as defined in claim 1, wherein said first 5 hydrolytic enzyme comprises *endo*-glucanase.
 10. A paper product as defined in claim 9, wherein said first hydrolytic enzyme comprises cellulose-binding domain free *endo*-glucanase.
 11. A paper product as defined in claim 5, wherein said second 10 hydrolytic enzyme comprises *endo*-glucanase.
 12. A paper product as defined in claim 11, wherein said second hydrolytic enzyme comprises cellulose-binding domain free *endo*-glucanase.
 13. A paper product as defined in claim 1, wherein a debonder is 15 incorporated into said paper product.
 14. A paper product as defined in claim 1, wherein a cross-linking agent is incorporated into said paper product.
 15. A paper product as defined in claim 14, wherein said cross-linking agent comprises a starch.
 16. A paper product as defined in claim 1, wherein said paper web 20 is single-layered.
 17. A paper product as defined in claim 1, wherein said paper web is multi-layered.
 18. A paper product that includes a multilayered paper web, said 25 multilayered paper web comprising:
 - a first layer containing hardwood fibers, wherein at least a portion of said eucalyptus fibers are treated with a first hydrolytic enzyme capable of hydrolyzing said hardwood fibers to form aldehyde groups predominantly on the surface of said hardwood fibers, wherein the dosage 30 of said first hydrolytic enzyme is from about 0.1 to about 10 s.e.u. per

dosage of said first hydrolytic enzyme is from about 0.1 to about 10 s.e.u. per gram of oven-dried pulp, wherein said first hydrolytic enzyme comprises *endo*-glucanase;

a second layer containing softwood fibers; and

5 wherein an additive is applied to said paper web, said additive being selected from the group consisting of a cross-linking agent, a strength agent, a debonder, and combinations thereof.

35. 19. A paper product as defined in claim 18, wherein at least a portion of said softwood fibers are treated with a second hydrolytic enzyme capable of hydrolyzing said softwood fibers to form aldehyde groups predominantly on the surface of said softwood fibers.

51 20. A paper product as defined in claim 19, wherein the dosage of said second hydrolytic enzyme is from about 0.1 to about 5 s.e.u. per gram of oven-dried pulp.

32 21. A paper product as defined in claim 19, wherein the dosage of said second hydrolytic enzyme is from about 0.1 to about 2 s.e.u. per gram of oven-dried pulp.

13 22. A paper product as defined in claim 18, wherein the dosage of said first hydrolytic enzyme is from about 0.1 to about 5 s.e.u. per gram of oven-dried pulp.

37 23. A paper product as defined in claim 18, wherein the dosage of
said first hydrolytic enzyme is from about 0.1 to about 2 s.e.u. per gram of
oven-dried pulp.

24. A paper product as defined in claim 18, wherein said first layer includes an additive selected from the group consisting of a cross-linking agent, a strength agent, a debonder, and combinations thereof

25. A paper product as defined in claim 18, wherein said second layer includes an additive selected from the group consisting of a cross-linking agent, a strength agent, a debonder, and combinations thereof.

26. A paper product as defined in claim 18, further comprising a third layer containing fibers selected from the group consisting of hardwood fibers, softwood fibers, and combinations thereof.
27. A paper product as defined in claim 26, wherein said third layer includes an additive selected from the group consisting of a cross-linking agent, a strength agent, a debonder, and combinations thereof.
28. A paper product as defined in claim 26, wherein at least a portion of said fibers of said third layer are treated with a third hydrolytic enzyme capable of hydrolyzing said fibers to form aldehyde groups predominantly on the surface of said fibers.
29. A paper product as defined in claim 28, wherein the dosage of said third hydrolytic enzyme is from about 0.1 to about 10 s.e.u. per gram of oven-dried pulp.
30. A paper product as defined in claim 28, wherein the dosage of said third hydrolytic enzyme is from about 0.1 to about 5 s.e.u. per gram of oven-dried pulp.
31. A paper product as defined in claim 28, wherein the dosage of said third hydrolytic enzyme is from about 0.1 to about 2 s.e.u. per gram of oven-dried pulp.
32. A paper product as defined in claim 26, wherein said first layer is positioned between said third layer and said second layer.
33. A paper product as defined in claim 26, wherein said third layer is positioned between said first layer and said second layer.
34. A paper product as defined in claim 18, wherein said first hydrolytic enzyme comprises cellulosic-binding-domain free endo-glucanase.
35. A paper product as defined in claim 19, wherein said second hydrolytic enzyme comprises cellulosic-binding-domain free endo-glucanase.

~~49~~36. A paper product as defined in claim 28, wherein said third hydrolytic enzyme comprises cellulosic-binding-domain free endoglucanase.

~~48~~ 37. A method for forming a paper product comprising:

5 providing a first fibrous furnish containing hardwood fibers;
providing a second fibrous furnish containing softwood fibers;
treating said first fibrous furnish with a first hydrolytic enzyme
capable of hydrolyzing said hardwood fibers to form aldehyde groups
predominantly on the surface of said hardwood fibers, wherein the
0 dosage of said first hydrolytic enzyme is from about 0.1 to about 5 s.e.u.

10 dosage of said first hydrolytic enzyme is from about 0.1 to about 5 s.e.u.
per gram of oven-dried pulp;

optionally, treating said second fibrous furnish with a second hydrolytic enzyme capable of hydrolyzing at least a portion of the softwood fibers of said second fibrous furnish to form aldehyde groups predominantly on the surface of said portion of softwood fibers, wherein the dosage of said second hydrolytic enzyme is from about 0.1 to about s.e.u. per gram of oven-dried pulp; and

forming a paper web from said first fibrous furnish and said second fibrous furnish.

20 38. A method as defined in claim 37, wherein said first hydrolytic enzyme comprises cellulose-binding-domain free *endo*-glucanase.

39. A method as defined in claim 37, wherein said second hydrolytic enzyme comprises cellulosic-binding-domain free endoglucanase.

25 52 40. A method as defined in claim 37, further comprising the step of
applying an additive to said first fibrous furnish, said second fibrous
furnish, or combinations thereof, said additive being selected from the
group consisting of a cross-linking agent, a strength agent, a debonder,
and combinations thereof.

blending said first fibrous furnish with said second fibrous furnish;
treating said blended furnish with a hydrolytic enzyme capable of
hydrolyzing at least a portion of the fibers of said blended furnish to form
aldehyde groups predominantly on the surface of said portion of fibers,
wherein the dosage of said hydrolytic enzyme is from about 0.1 to about
10 s.e.u. per gram of oven-dried pulp; and
forming a paper web from the blended furnishes.

54. A method as defined in claim 53, further comprising the step of applying an additive to said first fibrous furnish, said second fibrous furnish, said blended furnishes, or combinations thereof, said additive being selected from the group consisting of a cross-linking agent, a strength agent, a debonder, and combinations thereof.

~~4~~ 53 55. A method as defined in claim 53, wherein said hydrolytic enzyme comprises cellulosic-binding-domain free endo-glucanase.

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